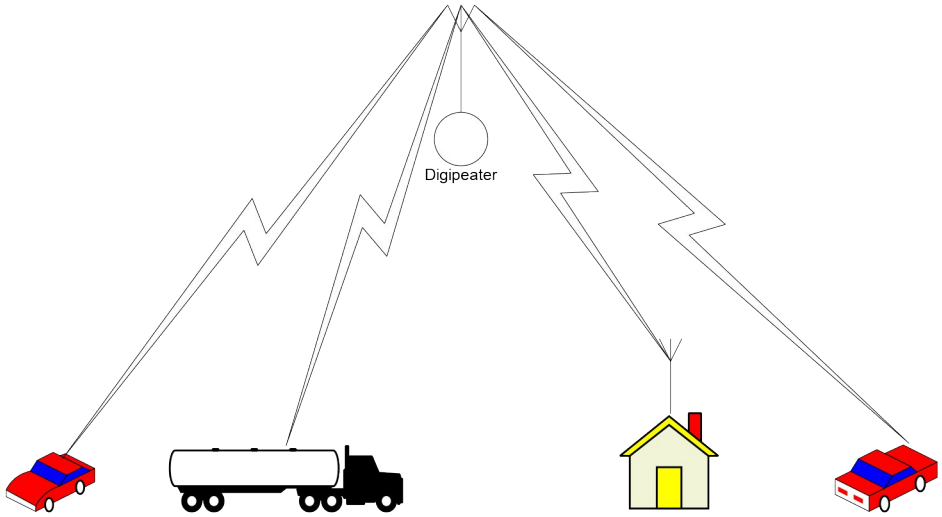
APRS for GCARES

Automatic Position Reporting System

- Original Name – Automatic Packet Reporting System
- Developed in 1990 based on 2 meter AX.25
- Designed for one-to-many communication of automated information
- Support for SMS (Short Messaging Service)

One-to-Many Communication



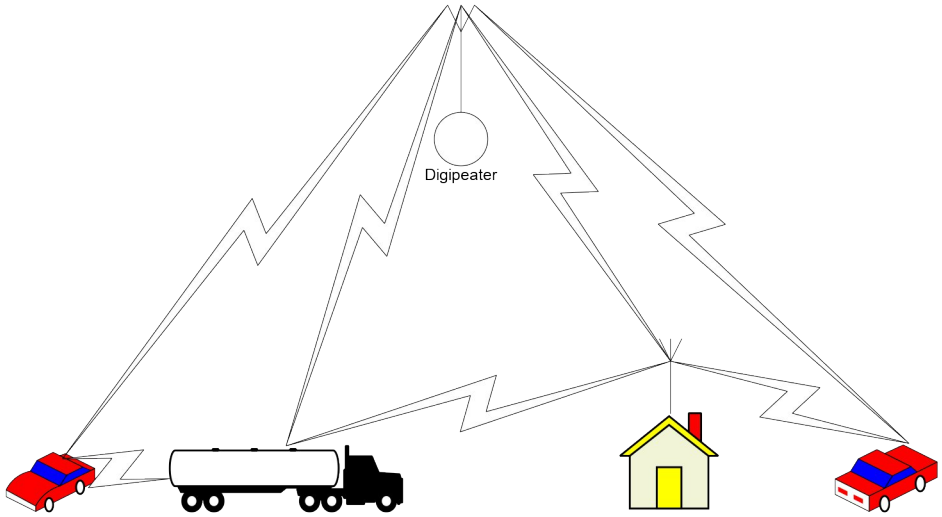
One-to-Many Communication

- Not Broadcast (according to FCC).
- Everyone sees all packets from everyone else.
- Information of value to amateur radio communicated.
- Two-way communication possible (most APRS is two-way).
- Unnumbered Information (UI) subset of AX.25

Digipeater

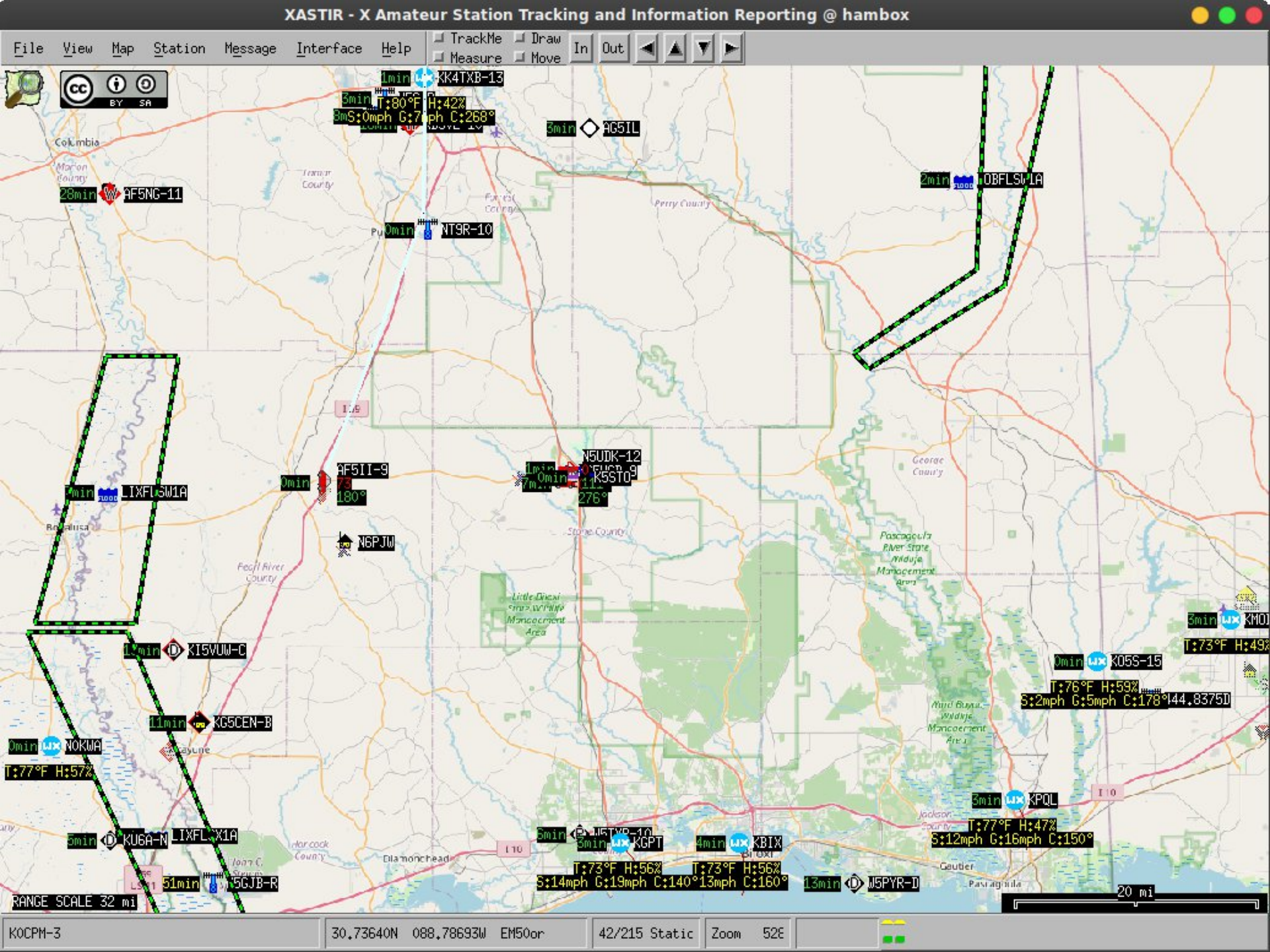
- AX.25 Digital Repeater
- APRS digipeaters only repeat UI packets
- APRS is Carrier-sense multiple access (CSMA)

One-to-Many Communication (CSMA)

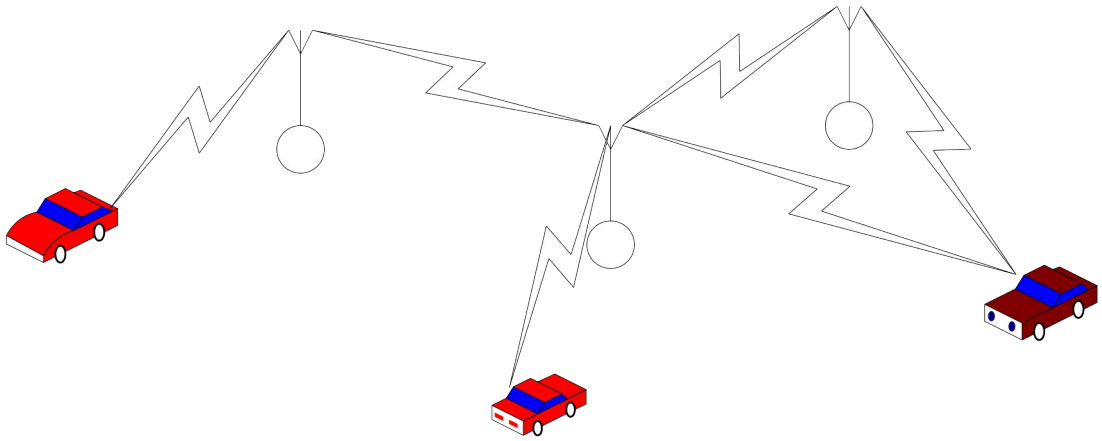


Information and Objects

- Vehicle Position and Movement Reporting
- Weather Reporting
- Telemetry Reporting
- Objects (includes fixed station positions)
- Bulletins
- Direction Finding Information
- Short (40 character) station-to-station messaging.
- Short bulletins of general interest.


XASTIR - X Amateur Station Tracking and Information Reporting @ hambox
File View Map Station Message Interface Help
TrackMe Draw
Measure Move
In Out
1min KK4TXB-13
3min T:80°F H:42%
3mS:0mph G:7 ph C:268°
3min AG5IL
28min AF5NG-11
0min NT9R-10
2min OBFLSW1A
0min AF5II-9
73
180°
N5UDK-12
K5STO
276°
N6PJW
0min LIXFLSW1A
11min KI5VUW-C
11min KG5CEN-B
0min NOKWA
T:77°F H:57%
5min KU6A-N LIXFL X1A
51min 5GJB-R
6min W5TVR-10
3min KGPT
4min KBIX
T:73°F H:56%
S:14mph G:19mph C:140°
T:73°F H:56%
13mph C:160°
13min W5PYR-D
3min KPQL
T:77°F H:47%
S:12mph G:16mph C:150°
3min KMO
T:73°F H:49%
0min KO5S-15
T:76°F H:59%
S:2mph G:5mph C:178°
44.8375D
RANGE SCALE 32 mi
20 mi
KOCPM-3
30.73640N 088.78693W EM50or
42/215 Static
Zoom 52E

Multi-hop Digipeating



Multi-hop Digipeating

- Packets from distant stations can adversely affect local operations.
- Remote stations have no ability for CSMA with local stations.
- Remote digipeaters may not be seen by local stations.

Where Will You Operate?

- Metropolitan area
  - Follow local standards.
    - Mobile – RELAY,WIDE
    - Fixed – Digicall (WIDE digipeater call)
    - Airmobile – WIDE
- Rural America
  - Mobile – RELAY,WIDE2-2
  - Fixed – Digicalls (path to nearest IGate, if desired)
  - Airmobile – WIDE

What Will Minimize QRM?

1) Number of Digipeats
   - **Minimize Path**
2) Beacon Rate
   - Seldom is anything less than **3 minutes** for mobiles useful
   - Weather Stations should be **5 – 15 minutes**
   - Fixed Stations should be **20 – 30 minutes**
3) Packet Length
   - **Eliminate** non-informative comments from packets

APRS Clients

- Software
  - UI-View
  - APRSdroid
  - Xastir
  - javAPRS
  - Pinpoint
  - APRSce
  - DireWolf
- Hardware
  - TNC's
  - TinyTrack
  - Kenwood TH-D7 & TM-D700
  - OpenTrack (in APRS mode)
  - Modern HTs with GPS

Vehicle Position and Movement

- The Original Purpose of APRS.
- Position Formats:
  - GPS NMEA strings
    - Primarily TNCS connected to GPS & Radio with no PC
  - APRS format
    - Most APRS client software, some trackers
  - Compressed APRS format
    - UI-View (possibly some other software/hardware)
  - Mic-E compressed format
    - Kenwood D7, D700, and some trackers

Weather and Telemetry Reports

- APRS format
- “RAW” format for select station types
- NWS now using much of the data
- Provides “hole” coverage where NWS stations don’t exist.
- Flexible enough to allow fully user-defined telemetry
- Valuable for monitoring remote radios

Objects

- Objects – Time-stamped position reports for other than the transmitting station
- Items – Same as objects without the time-stamp.
- Used for sending information of general interest to the area APRS users.
- Objects generated on the Internet for NWS events are gated to RF in many areas.
- Paths should be kept to a minimum.
- Beacon rate should be low, except in the case of the NWS objects which can change rapidly.

Bulletins

- Non-location specific information of general interest to area amateurs.
- NWS weather statements.
- Objects are used more frequently as they provide a location.

Short Messaging

- 40 character maximum
- Station to station using unconnected UI protocol
- For short, local messaging

Should I Put Up a Digipeater?

- Is your area already covered by a wide area digipeater?
- Is you location in a coverage hole?
- Will adding a digipeater at your location ADD to the usability of the local APRS frequency?

How Does the Internet Interact with APRS?

- APRS-IS – APRS Internet Service – Interconnect network of local APRS RF networks.
- IGate – Internet Gateway – Software/Hardware which gates packets to/from RF.

APRS Is…

- A one-to-many, unconnected packet protocol.
- A protocol with many reporting capabilities.
- A protocol with SMS capabilities.
- A protocol also adapted to the Internet.
- A protocol with extensive flexibility built-in.
- A protocol still under development.

AnyTone AT-UV878II APRS TX

- Much easier to enter APRS info and frequency in the Codeplug software as a channel called APRS.
- Turn on GPS
- Press **Menu** Button
- ⁀ key at top once to **APRS** and **Select**
- Press **[1] Upload Type**
  - Press **[2] Sel A APRS** then **Back** button
- Press **[2] Ana APRS**
  - Press **[1] PTT Upload**
    - Press **[3] TX End**

AnyTone AT-UV878II APRS RX

- Much easier to enter APRS info in the Codeplug software.
- Turn on GPS and once you have lock (Red icon at top)
- Turn to APRS channel preset.
- Press **Menu** Button and arrow down to **Settings** with ⁀ key
- Press **[2] Channel Set**
  - Press ⁀ key on top to **[27] APRS Receive** and press **Select**
    - Press **[3] On(Mute)**
    - Or **[1] Off** to stop

Q&A

- For More Information:
  - https://aprs.fi/#!call=a%2FN6PJW-8
  - http://www.findu.com/cgi-bin/find.cgi?call=N6PJW-8
  - https://aprs-map.info/?center=30.6166,-89.1774&zoom=9
  - https://support.bridgecomsystems.com/anytone-at-d878uvii-aprs-rx-setup

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